

IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE LOS ANGELES AND SALT LAKE RAILROAD, UNION PACIFIC SYSTEM, NEAR SANDY, UTAH, ON JULY 15, 1923.

On July 15, 1923, there was a derailment of a passenger train on the Los Angeles and Salt Lake Railroad, Union Pacific System, near Sandy, Utah, which resulted in the death of 3 employees, and the injury of 10 passengers, 1 employee, and 2 trespassers. This accident was investigated in conjunction with representatives of the Public Utilities Commission of Utah.

Location and method of operation.

This accident occurred on the Provo sub-division of the Salt Lake Division, a single-track line extending between Salt Lake City and Lynndyl, Utah, a distance of 134.1 miles, over which trains are operated by time-table and train orders, no block-signal system being in use. The point of accident was about 1 1/2 miles west of Sandy; approaching this point from the east the track is tangent for a distance of 2,502 feet, followed by a curve of 1 degree to the left which is 505 feet in length, the accident occurring on this curve near its leaving end. The grade is 0.75 per cent descending for a distance of 1,500 feet and then there is a vertical curve 600 feet in length leading to an ascending grade, the point of accident being near the beginning of the ascending grade. The track is laid with 90-pound rails, 33 feet in length, with an average of 18 treated ties to the rail-length, tie-plated, single-spiked, and ballasted with 3 or 4 inches of gravel; it is maintained in good condition. The weather was clear at the time of the accident. which occurred at 12.42 a.m.

Description.

Westbound passenger train No. 3 consisted of five baggage cars, one coach, one chair car, one tourist sleeping car, one Pullman sleeping car, and one business car, hauled by engine 3174, and was in charge of Conductor Valiant and Engineman Runswick. The second, fifth, and sixth cars were of wooden construction, while the others had steel underframes. Train No. 3 left Sandy at 12.32 a.m., two minutes late, and was derailed west of Sandy while traveling at a speed estimated to have been 25 or 30 miles an hour.

The engine came to rest on the left side of the track, bottom up, at the foot of a 35-foot embankment, with the tender partly under the engine. The first five cars were derailed at the time of the accident. while the sixth car tipped over about 35 minutes afterwards; the second car was derailed to the right, while the others were derailed to the left. The second and third cars were practically demolished. The employees killed were the engineman, fireman, and a student fireman.

Summary of evidence.

Conductor Valiant and Brakemen Marcott and Wing said they noticed no application of the air brakes prior to the derailment of the train, which was moving at a speed estimated by them to have been from 25 to 30 miles an hour. On examining the track they found water running in the drainage ditch on the left side of the track, and also found that the track had been undermined by the water. They estimated the stream of water in the ditch to have been 5 or 6 feet in width and varying in depth from a few inches to a foot.

On the south side of the track. referring to time-table direction, and about 180 feet distant from it, is a farm irrigated by water obtained from an irrigation ditch which is on the south side of the farm. To irrigate a tract of the size of this farm, the water is used for a period of

nine hours, usually once every seven or eight days. The stream of water thus used is about 2 feet wide and 18 inches in depth. The water not absorbed by the soil runs off at the north end of the farm and flows northward to the railroad track, at which point there is a 10-inch iron pipe to carry the water under the track and thence to a canal about 150 feet distant. On the south side of the track there is a ditch running parallel to the track to carry off drainage water from the right of way. This ditch extends westward for a distance of approximately 900 feet to where it reaches the 35-foot fill where the accident occurred.

On the night of the accident water to irrigate the farm had been turned on at about 10.20 p.m., no further attention being paid to it until after the accident occurred, when the owner of the farm was notified of the accident and then turned off the water. Examination showed that the iron pipe under the track had become clogged and that the water, instead of being carried under the track to the canal, had become diverted to the drainage ditch on the south side of the track and had flowed through that ditch for a distance of several hundred feet before it finally washed away the fine sandy soil on which the track is laid, undermining the left side of the track for a considerable distance. It further appeared that a dike had been erected by the owner of the farm on the side of his land nearest the railroad track in order to back up the water and irrigate one portion of the land which was higher than the rest of it; this dike, however, had broken and the soaked condition of the soil indicated that in some places the stream of water thus released and flowing toward the railroad track had been about 30 feet in width. In addition it also appeared that the land undoubtedly had not absorbed as much of the water as usual, as it had been irrigated only three days previously by someone having turned on the water in the absence of the owner. It also appeared that on the night of the accident, although the full flow of water was being used, yet only one-half of the land was being irrigated.

The owner of the farm said that on a previous occasion he had noticed that the pipe under the track had become clogged so that water could not pass through it, and at that time he had turned off the water but did not notify the railroad authorities concerning the condition of the pipe. Section Foreman Dow also said that on two occasions he had been notified by the dispatcher that there was water running over the track at this point, once about a year previously and the other time about a month previously, and while on reaching the spot he found that the water had gone down, due to the obstruction in the pipe evidently having cleared itself, yet the ballast was wet and showed that the water had been on the track, he said he had reported it to the roadmaster, but the latter said he did not recall any trouble of this kind at this point, which statement was also made by Division Engineer Strong.

#### Conclusions:

This accident was caused by a washout.

The water causing this washout came from an irrigation ditch, the full flow of which was being used although only half of the farm was being irrigated, and this flow of water, coupled with the breaking of the dike and possibly causing it to break, undoubtedly resulted in an unusual amount of water being carried toward the railroad track, and when the pipe intended to carry it under the track became clogged, this water found its way to the drainage ditch parallel to the track and ordinarily used only for draining the right of way. This water then flowed through that ditch for several hundred feet to where it washed away the side of the embankment, undermining the track and causing it to give way under the head end of the train.

The fact that this ditch had become clogged on previous occasions indicates that it was not large enough to allow a sufficient margin of safety in case there should be an unusual

amount of water flowing toward the track, and immediate steps to remedy such a condition should be taken.

At the time of the accident none of the employees involved had been on duty in violation of any of the provisions of the hours of service laws.